CS111 COMPUTER PROGRAMMING
LAB EXAM – II (SEMESTER I AY 2016-17), Duration 2 Hrs, 24-11-2016 _

Q1. Write a function to check the given arithmetic expression is balanced or not. An expression is said to be balanced if it has a matching closed parenthesis for every open parenthesis. While processing the expression, you may consider only the parentheses ( ) and skip any other characters in the expression.

Example:
Test case1 : Input: (a * (b + c) * d)
Output: Balanced expression.
Test case2: Input: x + (y * (z +1 – k))/(x * y)
Output: Balanced expression.

Test case3: Input: (x - y) * (x – y
Output: Unbalanced expression.

Test case4: Input:) x – y (*) x – y (
Output: Unbalanced expression.

Q2.

1. Create a user defined data type called ***point*** **with** two members, x and y.

2. Write a function **void init_point(point pts[ ], int n)** to initialize an array **pts** of **n=50** points with random coordinates in the range [0..100]. You may you built-in function **rand( )** in stdlib.h to generate a random number.

3. Write a function **int compare_points(point p1, point p2)** to compare if two points are same and return TRUE (non zero) if they are same; otherwise FALSE (zero).

4. Write a function **void swap_points(point *p1, point *p2)** to swap the members of two points, say p1 and p2 which are pass as arguments to the function.

5. Write a function **int find_unique(point pts[ ], int n, points upts[ ])** to find *the number of unique points* exits in the array of points **(pts)** passed as an argument to the function. Also return both a) *the number of unique points* and b) *the list of the unique points* in **upts** to the calling function.

Instructions: (marks are alloted for each the following, in addition to the correct logic and correct output)

1. No global variables
2. Use of functions wherever possible
3. Make your code readable
4. Write comments wherever necessary expiry